SR 87/SR 260/SR 377 CORRIDOR PROFILE STUDY

JUNCTION SR 202L TO JUNCTION I-40

ADOT Work Task No. MPD-028-16
ADOT Contract No. DT11-013152

Draft Working Paper 3: Corridor Performance Goals and Objectives

May 2016

PREPARED FOR:

Arizona Department of Transportation

PREPARED BY:

This report was funded in part through grants from the Federal Highway Administration, U.S. Department of Transportation. The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data, and for the use or adaptation of previously published material, presented herein. The contents do not necessarily reflect the official views or policies of the Arizona Department of Transportation or the Federal Highway Administration, U.S. Department of Transportation. This report does not constitute a standard, specification, or regulation. Trade or manufacturers' names that may appear herein are cited only because they are considered essential to the objectives of the report. The U.S. government and the State of Arizona do not endorse products or manufacturers.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ABBREVIATION	NAME
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
BCA	Benefit Cost Analysis
BLM	Bureau of Land Management
CAG	Central Arizona Governments
CCTV	Closed-circuit Television
CPS	Corridor Profile Study
DMS	Dynamic Message Sign
I	Interstate
L	Loop
LRTP	Long Range Transportation Plan
MAG	Maricopa Association of Governments
MP	Milepost
MPD	Multimodal Planning Division
NACOG	Northern Arizona Council of Governments
PA	Project Assessment
P2P	Planning to Programming
RWIS	Road Weather Information System
SERI	Species of Economic and Recreational Importance
SGCN	Species of Greatest Conservation Need
SHCG	Species and Habitat Conservation Guide
SHSP	Strategic Highway Safety Plan
SR	State Route
SRPMIC	Salt River Pima-Maricopa Indian Community
SWAP	State Wildlife Action Plan
TAC	Technical Advisory Committee
TI	Traffic Interchange
TPTI	Truck Planning Time Index
TTTI	Truck Travel Time Index
UP	Underpass
40B	I-40 Business Route

1.0 INTRODUCTION

The Arizona Department of Transportation (ADOT) is the lead agency for this Corridor Profile Study (CPS) of State Route 87 (SR 87)/State Route 260 (SR 260)/State Route 377 (SR 377) between State Route 202L (Loop 202) and Interstate 40 (I-40). This study will look at key performance measures relative to the SR 87/SR 260/SR 377 corridor, and the results of this performance evaluation will be used to identify potential strategic improvements.

The intent of the corridor profile program, and of the Planning to Programming (P2P) process, is to conduct performance-based planning to identify areas of need and make the most efficient use of available funding to provide an efficient transportation network. ADOT is conducting eleven corridor profile studies. The eleven corridors are being evaluated within three separate groupings.

The first three studies (Round 1) began in spring 2014, and encompass:

- I-17: SR 101L to I-40
- I-19: Mexico International Border to I-10
- I-40: California State Line to I-17

The second round (Round 2) of studies, initiated in spring 2015, includes:

- I-8: California State Line to I-10
- I-40: I-17 to the New Mexico State Line
- SR 95: I-8 to I-40

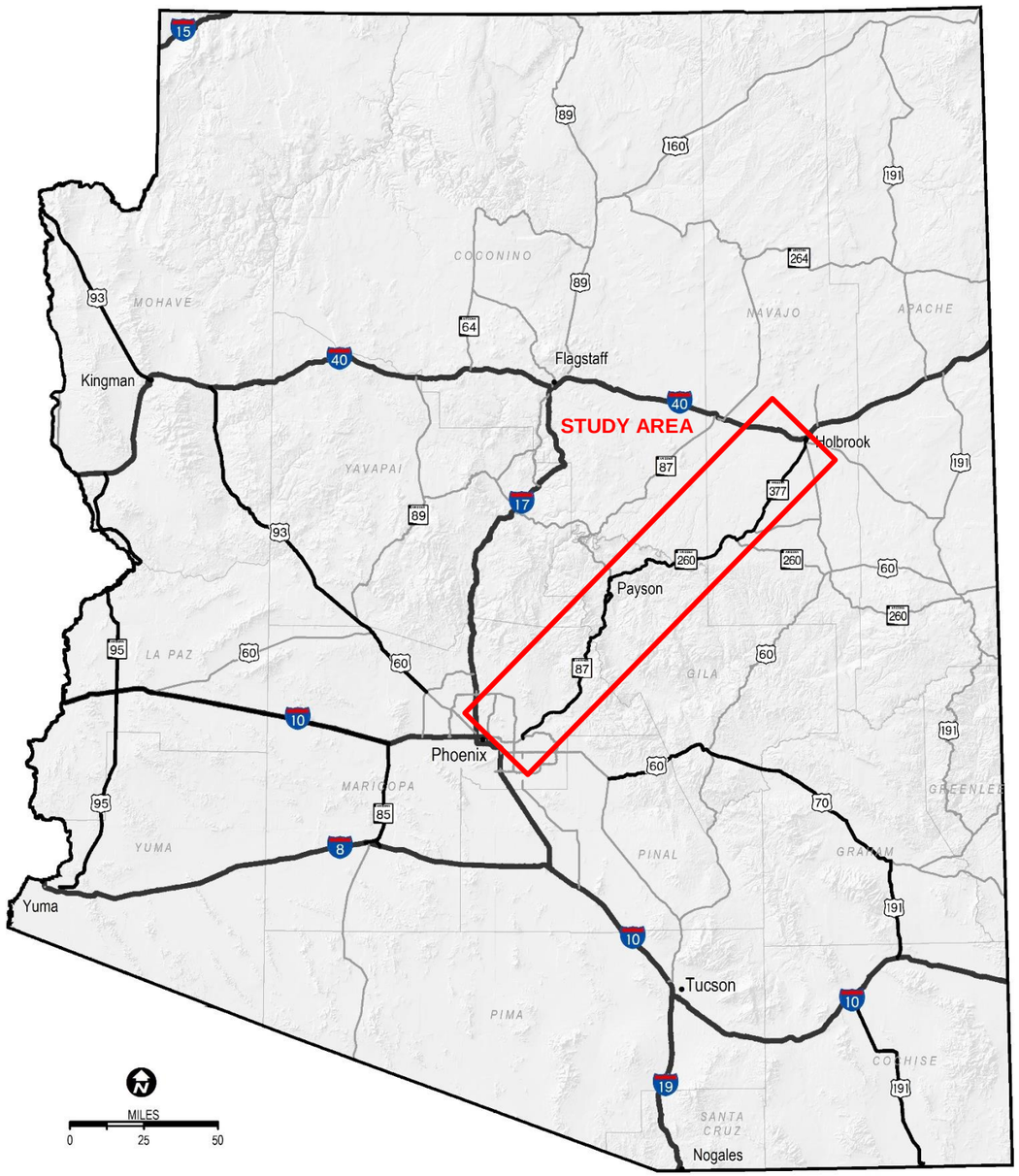
The third round (Round 3) of studies, to be initiated in fall 2015, includes:

- I-10: California State Line to SR 85 and SR 85: I-10 to I-8
- I-10: SR 202L to the New Mexico State Line
- SR 87/SR 260/SR 377: SR 202L to I-40
- US 60/US 70: SR 79 to US 191 and US 191: US 70 to SR 80
- US 60/US 93: Nevada State Line to SR 303L

The studies under this program will assess the overall health, or performance, of the state's strategic highways. The Corridor Profile Studies will identify candidate projects for consideration in the Multimodal Planning Division's (MPD) P2P project prioritization process, providing information to guide corridor-specific project selection and programming decisions.

SR 87/SR 260/SR 377, Loop 202 to I-40, depicted in **Figure 1**, is one of the strategic statewide corridors identified and is the subject of this Round 3 Corridor Profile Study.

Figure 1: Study Area



1.1 Corridor Study Purpose

The purpose of the Corridor Profile Study is to measure corridor performance to inform the development of strategic solutions that are cost-effective and account for potential risks. This purpose can be accomplished by following the process established by previous corridor profile studies to:

- Inventory past improvement recommendations.
- Define corridor goals and objectives.
- Assess existing performance based on quantifiable performance measures.
- Propose various solutions to improve corridor performance.
- Identify specific solutions that can provide quantifiable benefits in relation to the performance measures.
- Prioritize solutions for future implementation.

1.2 Corridor Study Goals and Objectives

The objective of this study is to identify a recommended set of prioritized potential solutions for consideration in future construction programs, derived from a transparent, defensible, logical, and replicable process. The SR 87/SR 260/SR 377 Corridor Profile Study will define solutions and improvements for the corridor that can be evaluated and ranked to determine which investments offer the greatest benefit to the corridor in terms of enhancing performance.

The following goals have been identified as the desired outcome of this study:

- Link project decision-making and investments on key corridors to strategic goals.
- Develop solutions that address identified corridor needs based on measured performance.
- Prioritize improvements that cost-effectively preserve, modernize, and expand transportation infrastructure.

1.3 Working Paper 3 Overview

The purpose of Working Paper 3 is to establish the context of the SR 87/SR 260/SR 377 corridor, summarize the results of the corridor performance, and develop goals, objectives, and emphasis areas for the corridor.

The framework for measuring performance is based upon the five performance areas used to characterize the health of the SR 87/SR 260/SR 377 corridor: pavement, bridge, mobility, safety, and freight. The product of Working Paper 3 is the development of performance goals and objectives for the corridor against which baseline performance can be evaluated. Differences between baseline performance and performance goals and objectives provide the framework for defining corridor needs in the investment areas of preservation, modernization, and expansion.

1.4 Corridor Overview

The SR 87/SR 260/SR 377 corridor between Loop 202 and I-40 provides movement for freight, tourism, and recreation needs within Arizona. It provides a key link between the Phoenix metropolitan area and the northeast region of the state and serves intrastate, interstate and international commerce. The corridor connects Mesa, Fountain Hills, Payson, Heber-Overgaard, and Holbrook as well as the Salt River Pima Maricopa Indian Community (SRPMIC), Fort McDowell-Yavapai, and Tonto Apache tribes. This corridor also serves a number of recreational areas and National Forests. The SR 87/SR 260/SR 377 corridor includes portions of SR 87, SR 260, SR 277, SR 377, SR 77, and I-40 Business Route (40B).

1.5 Study Location and Corridor Segments

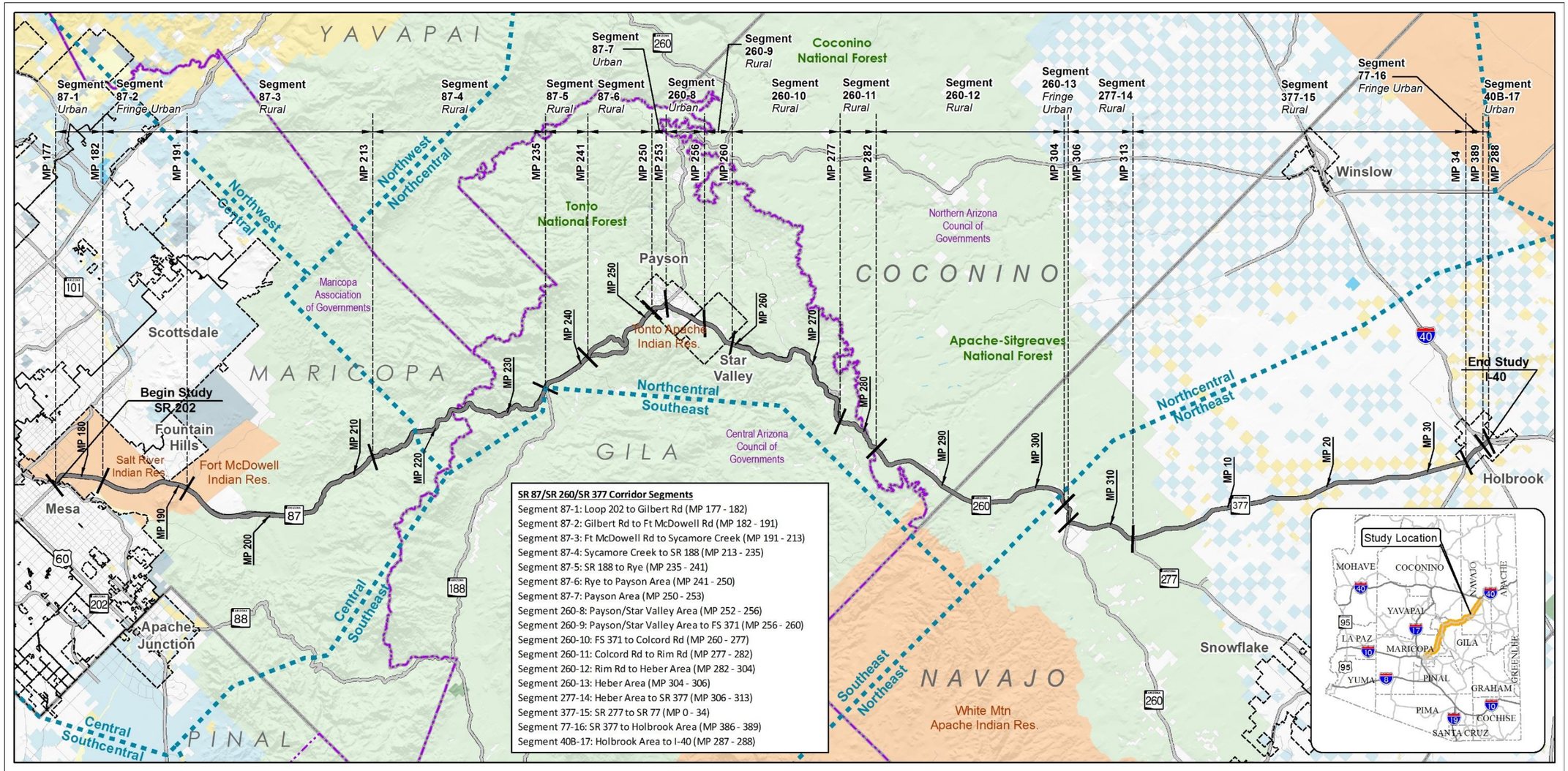
The SR 87/SR 260/SR 377 corridor between Loop 202 and I-40 is approximately 175 miles in length. The SR 87/SR 260/SR 377 corridor is located in three ADOT Districts (Central, Northcentral, and Northeast); three planning areas (Maricopa Association of Governments [MAG], Central Arizona Governments [CAG], and Northern Arizona Council of Governments [NACOG]); and four counties (Maricopa, Gila, Coconino, and Navajo).

The SR 87/SR 260/SR 377 corridor has been divided into 17 segments to allow for an appropriate level of detailed needs analysis, performance evaluation, and comparison between different segments of the corridor. These corridor segments are described in **Table 1** and shown in **Figure 2.**

Table 1: SR 87/SR 260/SR 377 Corridor Segmentation

Segment	Route	Begin	End	Approximate Begin Milepost	Approximate End Milepost	Approximate Length (miles)	Typical Through Lanes (NB/EB, SB/WB)	2014 Average Annual Daily Traffic Volume (vpd)	Character Description
87-1	SR 87	Loop 202	Gilbert Rd	177	182	5	2,2	15,000 – 16,000	This segment has interrupted flow, numerous access points, consistent traffic volumes, a five-lane undivided or four-lane divided section, and is located in the Phoenix metropolitan urban area.
87-2	SR 87	Gilbert Rd	Fort McDowell Rd	182	191	9	2,2	15,000 – 16,000	This segment has interrupted flow characteristics, access points, consistent traffic volumes, a four-lane divided section, and is located in the fringes of the Phoenix metropolitan urban area.
87-3	SR 87	Fort McDowell Rd	Sycamore Creek	191	213	22	2,2	9,000 – 10,000	This rural four-lane divided segment with uninterrupted flow has consistent topography and traffic volumes.
87-4	SR 87	Sycamore Creek	SR 188	213	235	22	2,2	10,000 – 11,000	This rural four-lane divided segment with uninterrupted flow has steep terrain and a curvy alignment.
87-5	SR 87	SR 188	Rye	235	241	6	2,2	11,000 – 12,000	This rural four-lane divided segment with uninterrupted flow has flatter terrain than surrounding segments.
87-6	SR 87	Rye	Green Valley Pkwy/BIA 101	241	250	9	2,2	11,000 – 12,000	This rural segment with uninterrupted flow is a climbing four-lane divided section.
87-7	SR 87	Green Valley Pkwy/BIA 101	SR 260	250	253	3	2,2	19,000 – 20,000	This segment has interrupted flow, numerous access points, is comprised of a five-lane undivided section and is located in the Payson urban area.
260-8	SR 260	SR 87	Mayfield Canyon Rd	252	256	4	2,2	14,000 – 15,000	This segment is comprised of a five-lane undivided section. It is located in the Payson/Star Valley urban area.
260-9	SR 260	Mayfield Canyon Rd	FS 371	256	260	4	1,1	13,000 – 14,000	This rural segment with uninterrupted flow is comprised of a two-lane undivided section.
260-10	SR 260	FS 371	Colcord Rd	260	277	17	2,2	6,000 – 7,000	This rural segment with uninterrupted flow is comprised of a four-lane divided section. It is a climbing section.
260-11	SR 260	Colcord Rd	Rim Rd	277	282	5	2,2	6,000 – 7,000	This rural segment with uninterrupted flow is comprised of a four-lane undivided section. It includes a climbing section to the top of Mogollon Rim.
260-12	SR 260	Rim Rd	Black Canyon Ln	282	304	22	1,1	5,000 – 6,000	This rural segment with uninterrupted flow is comprised of a two-lane undivided section.
260-13	SR 260	Black Canyon Ln	SR 277	304	306	2	2,2	7,000 – 8,000	This segment with uninterrupted flow is comprised of a five-lane undivided section. It is located in the fringes of the Heber-Overgaard urban area.
277-14	SR 277	SR 260	SR 377	306	313	7	1,1	1,000 – 2,000	This rural segment with uninterrupted flow is a two-lane undivided section.
377-15	SR 377	SR 277	SR 77	0	34	34	1,1	2,000 – 3,000	This rural segment with uninterrupted flow is a two-lane undivided section.
77-16	SR 77	SR 377	I-40 Business	386	389	3	1,1	7,000 – 8,000	This segment has interrupted flow, numerous access points, a two-lane or four-lane undivided section, and is located in the fringes of the Holbrook urban area.
40B-17	40B	SR 77	I-40/Navajo Blvd TI	287	288	1	2,2	10,000 – 11,000	This segment has interrupted flow, numerous access points, a four-lane or five-lane undivided section, and is located in the Holbrook urban area.

Figure 2: Segmentation Map



SR 87/SR 260/SR 377 Corridor Segments

Segment 87-1: Loop 202 to Gilbert Rd (MP 177 - 182)
Segment 87-2: Gilbert Rd to Ft McDowell Rd (MP 182 - 191)
Segment 87-3: Ft McDowell Rd to Sycamore Creek (MP 191 - 213)
Segment 87-4: Sycamore Creek to SR 188 (MP 213 - 235)
Segment 87-5: SR 188 to Rye (MP 235 - 241)
Segment 87-6: Rye to Payson Area (MP 241 - 250)
Segment 87-7: Payson Area (MP 250 - 253)
Segment 260-8: Payson/Star Valley Area (MP 252 - 256)
Segment 260-9: Payson/Star Valley Area to FS 371 (MP 256 - 260)
Segment 260-10: FS 371 to Colcord Rd (MP 260 - 277)
Segment 260-11: Colcord Rd to Rim Rd (MP 277 - 282)
Segment 260-12: Rim Rd to Heber Area (MP 282 - 304)
Segment 260-13: Heber Area (MP 304 - 306)
Segment 277-14: Heber Area to SR 377 (MP 306 - 313)
Segment 377-15: SR 277 to SR 77 (MP 0 - 34)
Segment 77-16: SR 377 to Holbrook Area (MP 386 - 389)
Segment 40B-17: Holbrook Area to I-40 (MP 287 - 288)

Miles
0 10 20

Corridor Segment
County Boundary
Interstate/Highway
City Boundary
ADOT District Boundary
MPO/COG Boundary

Land Ownership
Bureau of Land Management
Bureau of Reclamation
U.S. Forest Service
National Park Service
Indian Reservation
Military
Local or State Parks
State Trust Land
State Game and Fish
Private

SR 87/SR 260/SR 377 Corridor Profile Study: Loop 202 to I-40
Project Vicinity and Segmentation

2.0 CORRIDOR FUNCTIONALITY

The SR 87/SR 260/SR 377 corridor is an important travel corridor in the central/northeastern part of the state. The corridor functions as a route for recreational, tourist, and regional traffic and provides critical connections between the communities it serves and the rest of the regional and interstate network.

2.1 National Context

The SR 87/SR 260/SR 377 corridor is a strategic transportation link across central/northeastern Arizona for freight and intercity travel. The SR 87/SR 260/SR 377 corridor also functions as an alternate route to I-40/I-17 when either of those facilities is closed due to adverse weather or incidents.

2.2 Regional Connectivity

The SR 87/SR 260/SR 377 corridor between 202L and I-40 provides movement for freight, tourism, and recreation needs within Arizona. The corridor is located in three ADOT Districts (Central, Northcentral, and Northeast); three planning areas (MAG, CAG, and NACOG), and four counties (Maricopa, Gila, Coconino, and Navajo). Within the corridor study limits, SR 87/SR 260/SR 377 offers connections to several major roadways, including Loop 202 (SR 202L), Bush Highway, SR 188, SR 87, SR 260, SR 277, SR 77 and I-40. This corridor serves Arizona cities and towns including Mesa, Fountain Hills, Payson, Heber-Overgaard, and Holbrook as well as SRPMIC, Fort McDowell-Yavapai, and Tonto Apache tribes.

2.3 Commercial Truck Traffic

Communities along the SR 87/SR 260/SR 377 corridor are dependent on the corridor to access the state economy through freight deliveries and travel to other locations. Freight traffic (trucks) comprise from 2 to 12 percent of the total traffic flow on the corridor, with the higher truck percentages within the SR 87 portion of the corridor.

2.4 Commuter Traffic

A majority of the commuter traffic along the SR 87/SR 260/SR 377 corridor occurs within the urbanized areas of Mesa, Payson, and Holbrook. These areas are economic centers along what is considered mostly a rural combination of state routes. According to the most recent traffic volume data maintained by ADOT, traffic volumes range from approximately 1,200 vehicle per day on SR 77 and SR 377 portions of the corridor to approximately 19,000 vehicles per day in the Town of Payson area on SR 87 and SR 260.

According to the 2013 American Community Survey data from the US Census Bureau, 86% of the workforce in areas along the corridor relies on a private vehicle to get to work.

2.5 Recreation and Tourism

SR 87/SR 260/SR 377 provides access to many Arizona attractions such as state parks, national forests, and other recreational activities. SR 87/SR 260/SR 377 provides access to the Tonto National Forest and Apache-Sitgreaves National Forest. Other recreational destinations accessible from the SR 87/SR 260/SR 377 corridor include Petrified Forest National Park (via I-40 near Holbrook), Roosevelt Lake (via SR 188), and Tonto Natural Bridge State Park (via SR 87 north of Payson), to name a few.

2.6 Multimodal Uses

The statewide emphasis is to create a multimodal transportation system. This means that, while the safety and mobility of travelers via motor vehicles will remain a primary concern, the overall focus will be widened to include greater attention to all relevant modes of travel, including freight and passenger rail, bicycles, pedestrians, bus, transit, and aviation. This section provides a review of the status of these varying modes of transportation on the SR 87/SR 260/SR 377 corridor.

2.6.1 Freight Rail

The BNSF Railway, one of the top transporters of intermodal freight in North America, crosses through the City of Holbrook. The BNSF “Transcon Corridor” connects Los Angeles with Chicago and passes through northern Arizona, paralleling I-40. The BNSF Transcon Corridor typically carries up to about 120 trains per day. The BNSF Railway currently interchanges with a short line railroad, the Apache Railway, in Holbrook. The Apache Railway, which is no longer in service, terminates in Holbrook and travels southward, and was primarily used for paper and mining products[1].

2.6.2 Passenger Rail

Amtrak’s Southwest Chief Chicago to Los Angeles route primarily serves long-distance tourist travel, with daily service. The Southwest Chief shares track on the BNSF Transcon Corridor and is subject to delays caused by freight traffic. It travels at an average speed of 63 miles per hour across the State. There is no passenger station in Holbrook. The nearest passenger stations are in Winslow, Arizona and Gallup, New Mexico.

2.6.3 Bicycles/Pedestrians

Opportunities for bicycle and pedestrian travel are limited on SR 87/SR 260/SR 377. Bicycle traffic is permitted on the mainline outside shoulder; however, outside shoulder widths are relatively narrow and often less than the preferred 4-foot minimum width. SR 87, from milepost (MP) 182 to MP 250, has wider outside shoulders that are approximately 10 feet wide.

2.6.4 Bus/Transit

Valley Metro, the transit service for the Greater Phoenix Metropolitan area, offers two express bus routes near the southern terminus of the corridor in nearby Scottsdale and Mesa. The White Mountain Connection offers bus service from Holbrook to smaller communities south such as Snowflake, Taylor, Show Low, and Pinetop-Lakeside, along with stops at the Navajo County Government offices and Northland Pioneer College campuses. Greyhound operates intercity bus transit along I-40 in Arizona, with a stop in Holbrook.

[1] Source: Arizona State Rail Plan (2011), Appendix A

2.6.5 Aviation

There are two general aviation facilities in proximity to the SR 87/SR 260/SR 377 corridor. These include the Holbrook Municipal Airport, owned and operated by the City of Holbrook, and the Payson Municipal Airport, owned and operated by the Town of Payson. The southern portion of the corridor serves as a connection to numerous other airports located in the Phoenix Metropolitan area (via Loop 202).

2.7 Traveler Amenities

The corridor includes one rest area, Mazatzal Rest Area, located at the intersection of SR 188 and SR 87 (at approximately MP 235.7 on SR 87). The rest area is currently not in service. There are dynamic message signs (DMS), used for traveler information along the corridor, at the following locations:

- SR 87 NB, MP 191.2
- SR 260 EB, MP 255.0
- SR 260 EB/WB, MP 302.4
- SR 77 SB, MP 387.5
- Other designed DMS (SR 87 SB MP 179.5) and proposed DMS (SR 87 NB MP 181.0, SR 87 SB MP 183.0, SR 87 NB MP 188.0, SR 87 SB MP 201.0) are planned for implementation in the future

2.8 Tribes

A southern portion of the corridor traverses the SRPMIC (SR 87/202L Junction to SR 87 MP 188) and Fort McDowell-Yavapai (SR 87 MP 188 to SR 87 MP 193) Indian reservations. The Yavapai Tonto Apache Reservation is immediately adjacent to SR 87 near the southern portion of the Town of Payson (SR 87 MP 251). The Navajo and White Mountain Apache Reservations are in the vicinity of the northern portion of the corridor but not immediately adjacent to it.

2.9 Jurisdictions, Population Centers, and Major Traffic Generators

As shown previously in **Figure 2**, the SR 87/SR 260/SR 377 corridor traverses multiple jurisdictions and land owned or managed by various entities in four Arizona counties: Maricopa, Gila, Coconino, and Navajo. The southern section of the corridor traverses the SRPMIC and Fort McDowell Indian reservation lands. A majority of the corridor (from approximately SR 87 MP 195 to SR 377 MP 5) traverses Tonto and Apache-Sitgreaves National Forest land. Land ownership in and surrounding the Payson and Holbrook urban areas is mainly private, with the northern section of the corridor (SR 377 and SR 77) traversing a mix of private land, State Trust Land, and Bureau of Land Management (BLM) land.

2.9.1 Population Centers

Population centers of various sizes exist along the SR 87/SR 260/SR 377 corridor. **Table 2** provides a summary of the populations for communities along the corridor. Moderate population growth is projected between 2010 and 2035 in the major population centers along the corridor according to the Arizona State Demographer's Office.

Table 2: Current and Future Population

Area	2010 Population	2015 Population	2040 Population	% Change 2010-2040	Total Growth
Maricopa County	3,824,100	4,063,700	6,174,800	61%	2,350,700
Mesa	439,900	458,500	569,100	29%	129,200
Fountain Hills	22,400	23,600	31,100	39%	8,700
Gilbert	209,000	235,600	315,400	51%	106,400
Scottsdale	217,400	228,300	296,300	36%	78,900
Gila County	53,565	54,148	58,735	10%	5,170
Payson	15,270	15,674	18,481	21%	3,211
Navajo County	107,449	111,262	132,276	23%	24,827
Heber-Overgaard	2,822	2,935	3,675	30%	853
Holbrook	5,053	5,194	6,175	22%	1,122

Source: U.S. Census, Arizona Department of Administration – Employment and Population Statistics

2.9.2 Major Traffic Generators

The Phoenix Metropolitan area, along with the Town of Payson and City of Holbrook, are major traffic generators for the SR 87/SR 260/SR 377 corridor.

2.10 Wildlife Linkages Considerations

The Arizona State Wildlife Action Plan (SWAP) provides a 10-year vision for the entire state, identifying wildlife and habitats in need of conservation, providing insight regarding the stressors to those resources, and suggesting actions that can be taken to alleviate those stressors. The Habimap Tool™ (http://www.habimap.org/) provides an interactive database of information included in the SWAP. This database and other environmental resources should be conducted early on during all future project-related activities to ensure appropriate environmental compliance. The following wildlife and habitat considerations affecting rights-of-way along the SR 87/SR 260/SR 377 corridor were identified (these should not be considered a comprehensive listing of affected resources):

- Arizona Game and Fish Department (AGFD) Wildlife Waters are scattered near the corridor, specifically in the areas south of Payson, near Heber-Overgaard, and along SR 377.
- Arizona Important Bird Areas: The southern portion of the corridor is near the Salt and Verde Riparian Ecosystem Important Bird Area.
- The corridor travels through allotments controlled by the Arizona State Land Department, BLM, and United States Forest Service.
- Riparian areas include a few areas adjacent to SR 87 MP 207-224 and MP 230-245, numerous crossings along SR 260, SR 77, and SR 377, and along parts of I-40B.
- Arizona Wildlife Linkages: No missing linkages are noted, but there are potential Arizona Wildlife Linkage Zones along SR 87 from MP 215 to MP 235, along SR 260 from MP 253 to MP 302, and from SR 377 MP 6 to the northern terminus of the corridor in Holbrook on I-40B.

- According to the Species and Habitat Conservation Guide (SHCG), sensitive habitats that have moderate to high conservation potential exist along the corridor. These areas are located south of the Town of Payson and along SR 260 between Payson and Holbrook.
- Areas where Species of Greatest Conservation Need (SGCN) are high or moderately vulnerable are similar to the areas identified in the SHCG (see above).
- Identified areas of moderate or high levels of Species of Economic and Recreational Importance (SERI) are in the vicinity of SR 87, from approximately MP 195 to MP 245, and along SR 260 from approximately MP 253 to MP 302.

2.11 Transportation Assets

Corridor transportation assets are summarized in **Figure 3**. Climbing and passing lanes are located primarily on the SR 260 portion of the corridor between MP 285 and MP 305, where there are six climbing/passing lanes. There is one other climbing lane on SR 87 SB at approximately MP 205.

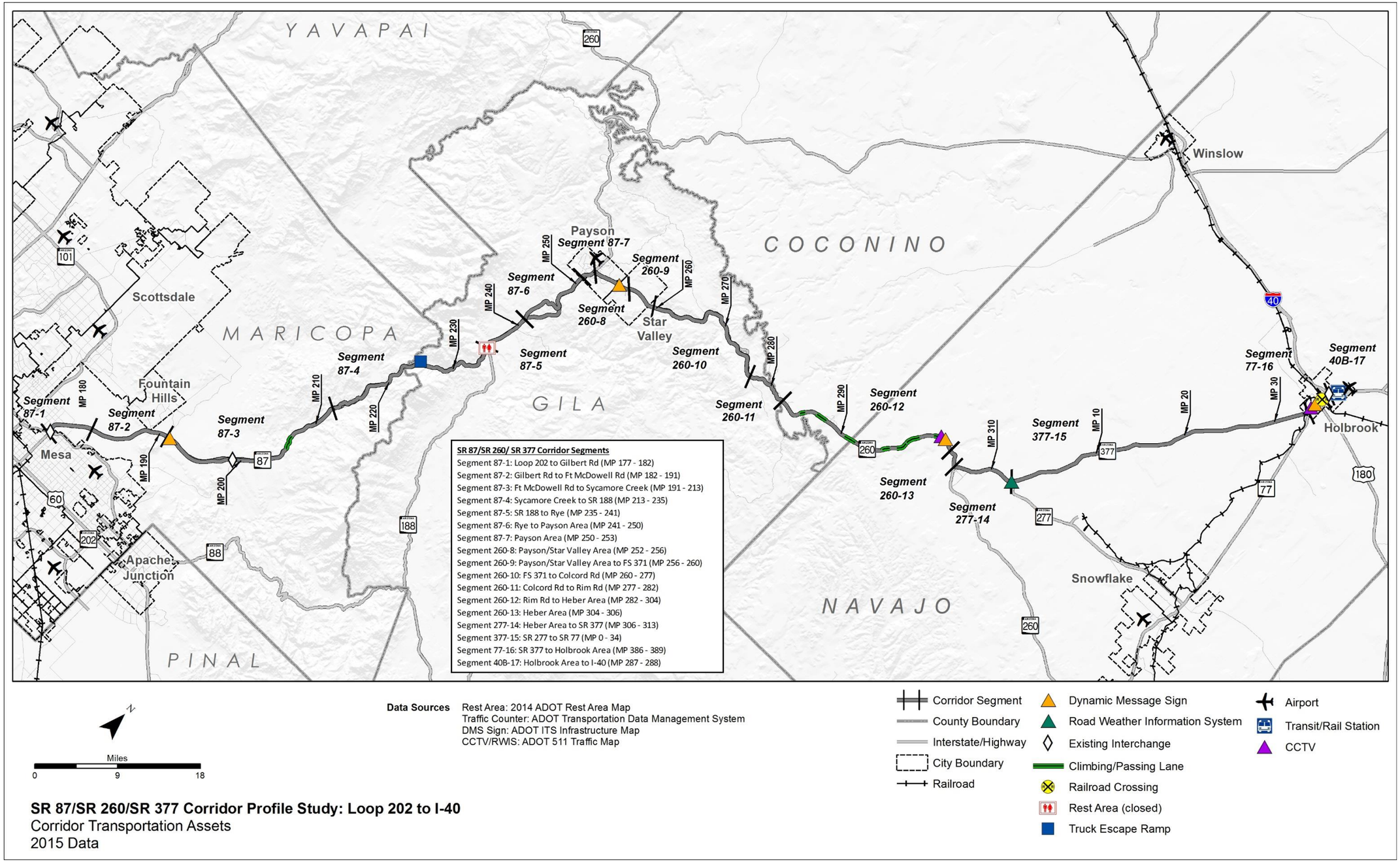
The corridor includes three traffic interchanges (TI): one interchange involving SR 87 and Bush Highway at approximately MP 199, one at the southern terminus of the corridor involving SR 87 and 202L, and one at the northern terminus of the corridor involving I-40B and I-40.

Other assets include the rest area (Mazatzal Rest Area SR 87 EB MP 235.7, currently closed) and DMS previously mentioned in section 2.7 and permanent traffic counters located at SR 87 MP 183, SR 87 MP 235, SR 260 MP 260, and SR 377 MP 30. There is a Road Weather Information System (RWIS) device located at the SR 277 and SR 377 intersection and a truck escape ramp on SR 87 NB near MP 227. Closed-circuit television (CCTV) cameras are located at SR 260 EB/WB, MP 302 and SR 77 NB/SB, MP 387.

2.12 Conclusion of Corridor Characteristics

The SR 87/SR 260/SR 377 corridor plays a pivotal role in connecting the Phoenix Metropolitan area with recreation outlets and communities in central/northeastern Arizona. The corridor functions as a route for recreational, tourist, and regional traffic. Multimodal travel options are fairly limited along the corridor. Population is anticipated to grow moderately in the communities along the corridor in the future.

Figure 3: Transportation Assets



SR 87/SR 260/SR 377 Corridor Profile Study: Loop 202 to I-40
Corridor Transportation Assets
2015 Data

3.0 SUMMARY OF CORRIDOR PERFORMANCE

A system to establish baseline corridor performance was developed through a collaborative process with ADOT, the Technical Advisory Committee (TAC) and the corridor teams for the profile studies. Baseline performance was evaluated using primary and secondary performance measures to define the corridor health and identify locations warranting further analysis to define needs. Corridor needs constitute the difference between baseline corridor performance and performance objectives.

The performance system consists of five areas: Pavement, Bridge, Mobility, Safety, and Freight. For each of these performance areas, a primary measure – known as the Index – was defined along with a set of secondary measures that allows for a more detailed analysis of corridor performance. **Table 3** lists the primary and secondary measures that were evaluated for each of the five performance areas.

Working Paper 2 evaluated the overall corridor performance (as a weighted average by segment length) and individual segment performance in the five aforementioned areas. The primary and secondary performance measures were quantified where feasible. A scale for each measure was developed based on adopted ADOT thresholds, where applicable, or on statistical analysis of statewide datasets. The scaling is split into three levels, each of which is represented by a corresponding color. The scale levels are named “good” (green), “fair” (yellow), and “poor” (red), except for measures based on a comparison to statewide averages (e.g., the Safety performance area) where the levels are called “above average” (green), “average” (yellow), and “below average” (red). Some of the secondary measures are “hot spots” that cannot be readily quantified at a segment or overall corridor level, so no scaling was developed for “hot spots”.

Good / Above Average Performance
Fair / Average Performance
Poor / Below Average Performance

The corridor weighted average ratings are summarized in **Figure 4**, which also provides a brief description of each performance measure. **Figure 5** shows the corridor and segment performance for each primary measure. The following sub-sections summarize the measured performance in each performance area according to the analysis findings documented in Working Paper 2.

Table 3: Performance Measures

Performance Index	Primary Measures	Secondary Measures
Pavement	**Pavement Index** (based on a combination of International Roughness Index and Cracking)	• Directional Pavement Serviceability • Pavement Failure • Pavement Hot Spots
Bridge	**Bridge Index** (based on Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating)	• Bridge Sufficiency Rating • Functionally Obsolete Bridges • Bridge Rating • Bridge Hot Spots
Mobility	**Mobility Index** (based on combination of Current V/C and Future V/C)	• Current Directional Peak Hour Volume/Capacity Ratio (V/C) • Future Daily V/C • Directional Travel Time Index (TTI) • Directional Planning Time Index (PTI) • Directional Road Closure Frequency • Non-Single Occupancy Vehicle Trips • Bicycle Accommodation
Safety	**Safety Index** (based on frequency of fatal and incapacitating injury crashes)	• SHSP Emphasis Areas • Crash Unit Types • Directional Safety Index • Safety Hot Spots
Freight	**Freight Index** (based on Truck Planning Time Index)	• Directional Truck Travel Time Index (TTTI) • Directional Truck Planning Time Index (TPTI) • Directional Road Closure Duration • Bridge Vertical Clearance • Bridge Clearance Hot Spots

Figure 4: Performance Summary

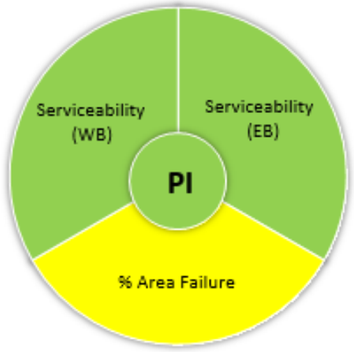
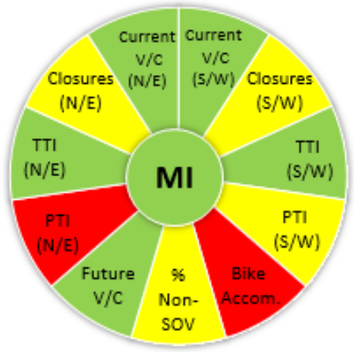
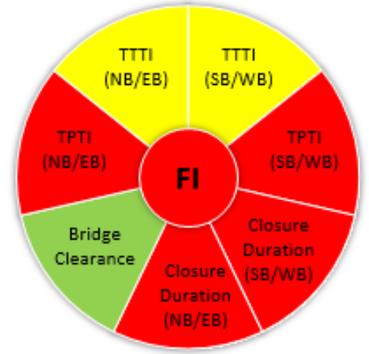
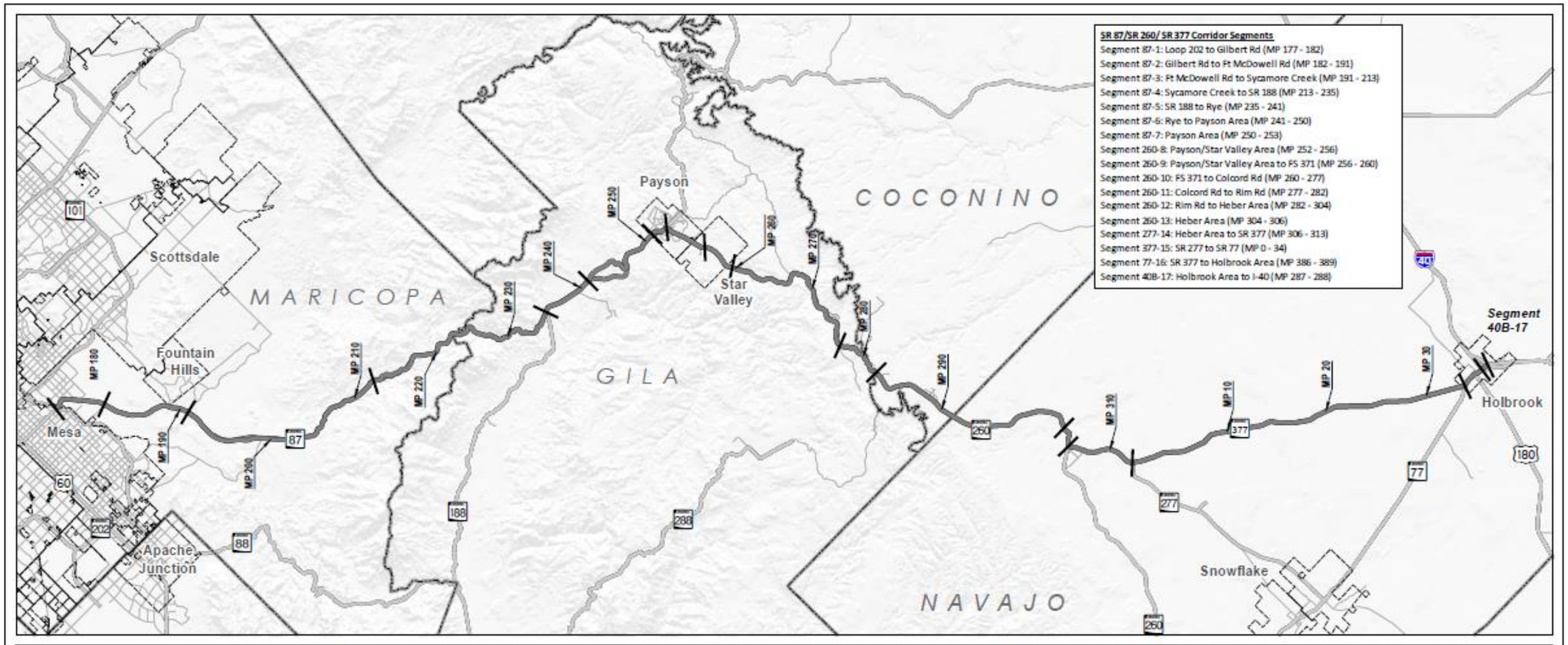
Pavement	Bridge	Mobility	Safety	Freight
				
Pavement Index (PI): based on two pavement condition ratings from the ADOT Pavement Database. The two ratings are the International Roughness Index (IRI) and the Cracking Rating. The calculation of the Pavement Index uses a combination of these two ratings.	**Bridge Index (BI):** based on four bridge condition ratings from the ADOT Bridge Database. The four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating.	**Mobility Index (MI):** an average of the current volume-to-capacity (V/C) ratio and the projected 2035 V/C ratio.	**Safety Index (SI):** combines the bi-directional frequency and rate of fatal incapacitating injury crashes, compared to crash occurrences on similar roadways in Arizona.	**Freight Index (FI):** a reliability performance measure based on the bi-directional planning time index for truck travel.
➢ **Directional Pavement Serviceability** – the weighted average (based on number of lanes) rating which measures the condition of the pavement in each direction of travel. ➢ **Pavement Failure** – the percentage of pavement area that is rated above the failure thresholds for IRI or Cracking, as established by ADOT Materials Group (IRI > 105 or Cracking > 15).	➢ **Sufficiency** – indicative of bridge sufficiency to remain in service. The factors that contribute to the Sufficiency Rating include structural adequacy and safety, serviceability and functional obsolescence, and essentiality for public use. ➢ **% Functionally Obsolete** – indicative of the percentage of deck area on bridges that is no longer functionally adequate for its current use, such as lack of shoulders or the inability to handle current traffic volumes. Functionally Obsolete does not directly relate to the structural adequacy. ➢ **Bridge Rating** – identifies the lowest rating on each segment.	➢ **Directional Current V/C** – the existing peak hour V/C ratio in both directions of the corridor. This measure provides an understanding of the directional operating characteristics of the corridor during the existing peak hour from a mobility congestion standpoint. ➢ **Future V/C** – a measure of the future 2035 V/C ratio that identifies how the corridor will operate in the future from a mobility congestion standpoint. ➢ **Directional Closures** – the average number of times a given location in the corridor was closed per mile in a specific direction of travel per year. ➢ **Directional Travel Time Index (TTI)** – the ratio of the average peak period travel time to the free-flow travel time. The TTI represents recurring delay along the corridor. ➢ **Directional Planning Time Index (PTI)** – the ratio of the total travel time needed for 95 percent on-time arrival to free-flow travel time. The PTI represents non-recurring delay along the corridor. ➢ **% Non-single Occupancy Vehicle Trips (Non-SOV)** – represents the percentage of trips that are taken by vehicles carrying more than one occupant. ➢ **Bicycle Accommodation** – represents the percentage of roadway that is accommodating for bicycle travel.	➢ **% SHSP Emphasis Area** – the percentage of fatal and incapacitating crashes that involve at least one of the five Strategic Highway Safety Plan (SHSP) Emphasis Areas on a given segment compared to the statewide average percentage of crashes involving at least one of the five SHSP Emphasis Areas on roads with similar operating environments. ➢ **Directional Safety Index** – the combination of the directional frequency and rate of fatal incapacitating injury crashes, compared to crash occurrences on similar roadways in Arizona. ➢ **% SHSP Crash Unit Types** – the percentage of total fatal and incapacitating injury crashes that involves a given crash unit type (motorcycle, truck, non-motorized traveler) is compared to the statewide average percentage on roads with similar operating environments.	➢ **Directional Truck Planning Time Index (TPTI)** – the ratio of total travel time (for trucks only) needed for 95 percent on-time arrival to free-flow travel time. The TPTI represents non-recurring delay along the corridor. ➢ **Directional Truck Travel Time Index (TTTI)** – the ratio of the average peak period travel time (for trucks only) to the free-flow travel time. The TTTI represents recurring delay that occurs along the corridor. ➢ **Directional Closure Duration** – the average time a given location in the corridor was closed per mile per year. ➢ **Bridge Clearance** – the minimum vertical clearance for all underpass structures within each segment as determined via the ADOT Bridge Database.

Figure 5: Performance Index Summary



Performance Area	87-1	87-2	87-3	87-4	87-5	87-6	87-7	260-8	260-9	260-10	260-11	260-12	260-13	277-14	377-15	77-16	40B-17	Weighted Average
Pavement	4.19	4.25	3.80	4.05	4.55	4.15	3.54	4.31	4.27	4.03	4.13	3.78	3.11	2.05	4.12	3.25	No Data	3.94
Bridge	7.00	7.00	6.95	6.31	6.31	No Bridges				6.81	6.73	7.00	6.00	No Bridges		6.00	No Bridges	6.70
Mobility	0.65	0.73	0.21	0.23	0.15	0.21	0.75	0.54	0.94	0.08	0.12	0.36	0.14	0.09	0.09	0.85	0.45	0.26
Safety	3.01	0.62	1.19	1.62	1.22	2.11	1.32	0.28	1.63	0.93	0.32	1.43	0.11	0.13	1.18	2.19	3.46	1.26
Freight	0.28	0.29	0.53	0.51	0.56	0.44	0.28	0.15	0.47	0.58	0.54	0.69	0.36	No Data		0.22	0.05	0.50

SR 87/SR 260/SR 377 Corridor Profile Study: Loop 202 to I-40
Primary Performance Index Summary

3.1 Pavement

The weighted average of the Pavement Index indicates “good” overall pavement conditions for the SR 87/SR 260/SR 377 corridor. Segment 14 has “poor” Pavement Index and % Area Failure ratings. Segment 13 has “poor” Directional PSR and % Area Failure ratings. Segment 16 has “poor” % Area Failure ratings. Segment 17 and part of Segment 4 (MP 224-226 only) have insufficient data to calculate ratings. There are several pavement hotspots that exist in Segments 1, 3, 12, 13, 14, 16.

3.2 Bridge

All segments that contain bridges have a “good” or “fair” rating for Bridge Index, Bridge Sufficiency, and Bridge Rating. There is one functionally obsolete bridge in Segment 16. There are no bridge hot spots. Many segments along the corridor do not contain any bridges.

3.3 Mobility

The weighted average of the Mobility Index indicates “good” overall mobility conditions for SR 87/SR260/SR 377. Segments 2, 7, and 16 indicate “fair” conditions while “poor” conditions are present on Segment 9. During the existing peak hour, traffic operations are “good” for all segments with exception of Segment 9. Segments 2, 7, 9, and 16 are anticipated to have “poor” performance in the future, according to the Future V/C performance measure.

A majority of the segments show “good” or “fair” performance in the closure extent performance measure, with Segments 3, 4, 11, and 12 showing “poor” performance in one or both directions. Closure data was not available for Segment 17. TTI and PTI data was not available for Segments 14 and 15. The TTI measures show “good” or “fair” performance for all segments while the PTI measures show “poor” or “fair” performance for a majority of the segments. A majority of the corridor shows “poor” or “fair” performance for non-SOV trips, meaning that many vehicles carry only a single occupant. Finally, a majority of the corridor shows “poor” performance in bicycle accommodation, indicating most of the corridor – particularly those segments not pertaining to SR 87 – has narrow shoulders.

3.4 Safety

The Safety Index for the overall SR 87/SR 260/SR 377 corridor is above the statewide average for similar operating environments, meaning the corridor has “below average” performance. This means SR 87/SR 260/SR 377 has more fatal and incapacitating injury (F+I) crashes than the statewide average for other similar operating environments. The safety performance evaluation utilized three operating environments for the analysis. The operating environments for SR 87/SR 260/SR 377 corridor include 2 or 3 or 4 Lane Divided Highway segments (Segments 1-6 and 10), 2 or 3 Lane Undivided Highway segments (Segments 9, 11, 12, and 14-16), and 4 or 5 Lane Undivided Highway segments (Segments 7, 8, 13, and 17).

For most segments, the Directional Safety Index shows one direction has “above average” performance while the other direction has “average” or “below average” performance, suggesting that directionality is a factor in safety performance on the corridor. Segments 6 and 15 perform “below average” in the top 5 Strategic Highway Safety Plan (SHSP) emphasis areas while Segments 3 and 4 perform “below average” in motorcycle-involved crashes. Several segments did not have a sufficiently large enough sample size of crash data to be able to conduct an analysis of safety performance related to the Top 5 SHSP emphasis areas and motorcycle-involved crashes. The entire corridor had an insufficient sample size of crash data to be able to conduct an analysis of safety performance related to crashes involving trucks or non-motorized travelers (pedestrians and bicyclists).

3.5 Freight

The performance of freight mobility for SR 87/SR 260/SR 377, according to the Freight Index, is overall “poor”. The Freight Index shows “fair” or “poor” performance for all segments for which data is available. Most of the corridor segments have a “good” or “fair” performance rating in terms of the directional TTTI measure, which indicates that minimal recurring congestion is experienced on the corridor. The overall weighted average of the directional TPTI measure indicates that the corridor has “poor” travel time reliability in both directions due to non-recurring congestion. Segment 17 has abnormally high Directional TPTI values, which could be associated with the at-grade railroad crossing near the Segment 16/17 boundary or could indicate potential data integrity issues.

For most segments, the Closure Duration ratings show “fair” or “poor” performance in one direction while the performance in the opposite direction shows much better performance. This could be due to how closures that affect both directions are coded in the data. Segments 3 and 4 show abnormally high directional closure durations. A review of the data indicates these high closure durations were due to SR 87 being closed for several days due to a fire in the area. Segments 3 and 4 are the only segments on the corridor that contain underpasses (UP), and all Ups provide “good” vertical clearance.

4.0 CORRIDOR PERFORMANCE GOALS AND OBJECTIVES

Statewide goals and performance measures were established by the ADOT *What Moves You Arizona* Long-Range Transportation Plan (LRTP) through an extensive outreach program. The statewide goals relevant to the SR 87/SR 260/SR 377 performance framework areas have been identified as part of Working Paper 3 efforts and coordinated with the corridor performance goals and objectives for the corridor developed based on discussions with stakeholders within the corridor.

The SR 87/SR 260/SR 377 corridor performance goals are:

- Improve mobility through additional capacity and improved roadway geometry
- Provide a safe and reliable route for recreational and tourist travel
- Provide a safe, reliable and efficient freight route between the Phoenix area and northeast Arizona
- Preserve and modernize highway infrastructure
- Provide a safe, reliable, and efficient connection for the communities along the corridor
- Promote safety by implementing appropriate countermeasures

Specific objectives have been developed for the SR 87/SR 260/SR 377 corridor to meet these performance goals, as detailed below:

- Reduce current congestion and plan to facilitate future congestion that accounts for anticipated growth and land use changes
- Reduce delays from recurring and non-recurring events to improve reliability, especially in Payson and Holbrook
- Improve bicycle and pedestrian accommodations
- Reduce delays and restrictions to freight movement to improve reliability
- Improve travel time reliability (including impacts to motorists due to freight traffic)
- Maintain structural integrity of bridges
- Improve pavement ride quality for all corridor users
- Reduce long-term pavement maintenance costs
- Reduce fatal and incapacitating injury crashes for all roadway users

Table 4 shows the aligned statewide and SR 87/SR 260/SR 377 corridor goals and objectives.

4.1 Stakeholder Input

Meetings were held with the following agencies to review the performance framework, performance measures, and performance outcome, and to discuss performance goals and objectives:

- **ADOT Northcentral District/NACOG/Town of Payson:** This meeting was held on February 26, 2016 and included participants from the ADOT Northcentral District, ADOT MPD, NACOG, Town of Payson, and the consultant team.
- **ADOT Central District/MAG:** This meeting was held on February 29, 2016 and included participants from the ADOT Central District, ADOT MPD, MAG, and the consultant team.
- **ADOT Northeast District/CAG/NACOG:** This meeting was held on March 8, 2016 and included participants from the ADOT Northeast District, ADOT MPD, NACOG, and the consultant team.

The meeting attendees provided the following comments, grouped by performance area, with respect to the results of the performance evaluation and the development of goals and objectives for the corridor:

General Comments

- Attendees generally agreed that the performance system results make sense and reflect existing conditions of the corridor.
- Overall, the corridor has not had many recently completed projects.
- There was general concurrence that the three performance emphasis areas for the SR 87/SR 260/SR 377 corridor should be Mobility, Safety, and Freight.
- The possibility of changing performance emphasis areas between segments was brought up by District staff as emphasis areas in urban areas may be different from rural areas.
- The Town of Payson would like to be included in the TAC. The District supports this.

Pavement Performance Area

- A project goes out to bid on March 4, 2016 for spot repairs on SR 260 between MP 282 and MP 290, specifically in two areas: MP 282-285 and MP 288-290. Spot repairs include 1 ½" mill and replacement with rubberized AC surface treatment. There may be drainage or subgrade issues in these areas – often the surrounding soil is wet. The area was chip sealed 3-4 years ago, but was not effective due to the snowplows ripping off the surface the following winter. Currently, the district fills many potholes in this stretch of the corridor. No geotechnical study has been completed for this area. This has been an area of concern for the last 5-6 years.
- A hot spot is missing for MP 224 on SR 87 due to insufficient data for that MP. History shows landslides and pavement issues in this area.
- MP 226-231 on SR 87 is scheduled for pavement rehabilitation for FY 2017-2018.
- SR 87 in Payson currently contains many potholes (from around the casino to the SR 87/SR 260 junction). The area was crack sealed recently but still contains many issues.
- The pavement on SR 87 between Gilbert Road and Shea Boulevard was rehabilitated about six years ago. Spot repairs will be happening soon on this stretch of SR 87.

Bridge Performance Area

- MP 262.5 (EB and WB) on SR 260 the approach slabs continue to settle around the bridge deck, causing a potential safety concern as motorists travel at a high speed.

Mobility Performance Area

- This performance area was proposed to be an emphasis area for the corridor.
- A future university is proposed in the Payson area (potentially affecting approximately MP 254-260 on SR 260). This addition would increase volumes near this stretch of the corridor and around the Payson area in general.

- SR 87 experiences much higher volumes on weekends and holidays than on typical weekdays.
- The SR 87/SR 260 intersection experiences heavy traffic, particularly on weekends, holidays, or during large recreation events.
- SR 87 and SR 260 through the Payson and Star Valley urban areas are becoming more congested as development increases, similar to how Milton Road in Flagstaff is.
- A climbing lane was proposed for MP 268-270 NB on SR 260 with the initial Project Assessment (PA) completed in 2008. The project was never built.
- The two main railroad tracks carry up to 130 trains per day so closures for train crossings are frequent.
- An alternate route for connecting SR 77 to I-40 around Holbrook that goes over the railroad tracks and the river is desired by the District to avoid significant congestion on SR 77 near the railroad crossing and on I-40 Business Loop. A study was done in the past that recommended an alternate route that looped east of Holbrook.
- The poor PTI value for Segment 13 seems inaccurate and may be counting the speed of vehicles parked at businesses along SR 260.
- Most bicycle traffic around Payson is on SR 87 north of SR 260.
- Bicyclists might use SR 377 more frequently if a shoulder were present.
- A DMS is planned for installation on SR 87 in the SB direction north of Mesa Drive (south of MP 202) in the next 2-3 years.
- Brake check areas on SR 87 may need to be assessed.
- SR 260 currently has a 55 mph speed limit south of the rim. The District would like to see the curves fixed so the speed limit can be raised to 65 mph.

Safety Performance Area

- This performance area was proposed to be an emphasis area for the corridor.
- SR 87 SB at MP 246, known as Corvair Curve, has historically had many crashes. Temporary jersey barriers had been placed in the past to promote safety but they have since been removed.
- The SR 188/SR 87 intersection seems to have lots of crashes. A Road Safety Assessment (RSA) has been completed. Many vehicles run the stop sign on SR 188. The area experiences heavy recreational use (trucks with trailers or boats). A grade-separated interchange is desired by the District.
- The intersection of SR 77 and SR 377 has experienced fatalities in the past.
- There is no left-turn lane on SR 77 in Holbrook south of Erie Street, which is a safety and operations concern.
- Improvements to five horizontal curves are currently programmed for FY 2018 on the north end of SR 377. Five more horizontal curve issues on the south end of SR 377 have been submitted for future funding.
- Coordinating the traffic signal timing at I-40 Business Loop/SR 77 to the railroad crossing would be beneficial.
- There have not been any issues with safety or operations at the spur railroad track crossing on SR 377 as it is not a heavily utilized spur.

Freight Performance Area

- This performance area was proposed to be an emphasis area for the corridor.
- When I-40 experiences heavily delays or closures, the SR 260 portion of the corridor experiences heavy truck traffic.

4.2 Performance Emphasis Areas

Based on stakeholder input, the Mobility, Safety, and Freight performance areas were identified as "emphasis areas" for the SR 87/ SR 260/SR 377 corridor. As such, corridor-wide weighted average performance objectives for Mobility, Safety, and Freight are identified with a higher standard than the performance objectives for other performance areas.

4.3 Performance Objectives

Taking into account the corridor performance goals and identified "emphasis areas", performance objectives were developed for each quantifiable performance measure that identify the desired level of performance based on the performance scale levels for the overall corridor and for each segment of the corridor. The performance objectives within each of the five performance areas are shown in **Table 4**.

The colors shown in **Table 4** represent the corresponding level of performance as described earlier, with green indicating "good" or "above average" performance, yellow indicating "fair" or "average" performance, and red indicating "poor" performance. Good/above average performance is the desired level of performance for the overall corridor primary measure for performance areas designated as "emphasis areas". Fair or average performance is the desired objective for all segments in all performance areas and for the corridor weighted average for performance areas that are not emphasis areas.

Table 4: Performance Goals and Objectives

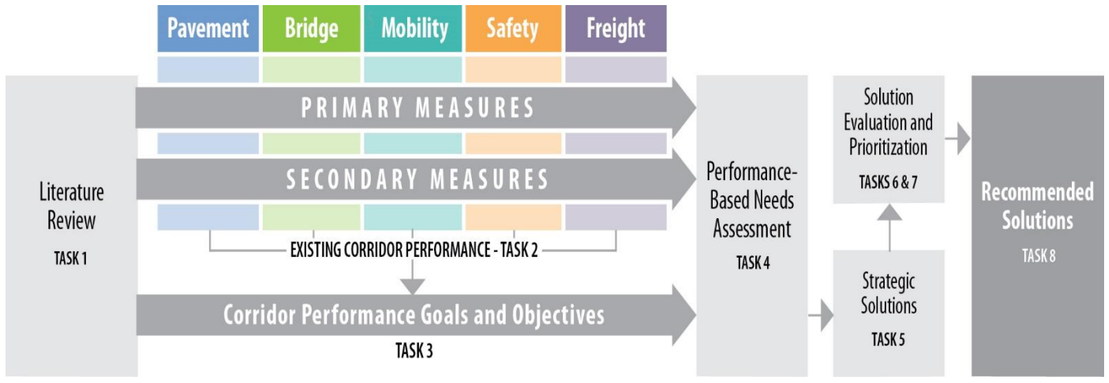
ADOT Statewide LRTP Goals	SR 87/SR 260/SR 377 Corridor Goals	SR 87/SR 260/SR 377 Corridor Objectives	Performance Area	Performance Measure	Performance Objective	
					Corridor Average	Segment
Improve Mobility and Accessibility	Improve mobility through additional capacity and improved roadway geometry Provide a safe and reliable route for recreational and tourist travel Provide safe, reliable and efficient connection for all communities along the corridor	Reduce current congestion and plan to facilitate future congestion that accounts for anticipated growth and land use changes	Mobility (*Emphasis Area*)	Mobility Index	Good	Fair or better
				Existing Directional Peak Hour V/C		Fair or better
				Future Daily V/C		Fair or better
		Reduce delays from recurring and non-recurring events to improve reliability, especially in Payson and Holbrook		Directional Closure Frequency		Fair or better
				Directional Travel Time Index		Fair or better
				Directional Planning Time Index		Fair or better
				Percent Non-SOV Trips		Fair or better
		Improve bicycle and pedestrian accommodations		Percent Bicycle Accommodation		Fair or better
Support Economic Growth	Provide a safe, reliable and efficient freight route between the Phoenix area and northeast Arizona	Reduce delays and restrictions to freight movement to improve reliability Improve travel time reliability (including impacts to motorists due to freight traffic)	Freight *(Emphasis Area)*	Freight Index	Good	Fair or better
				Directional Truck Travel Time Index		Fair or better
				Directional Truck Planning Time Index		Fair or better
				Directional Closure Duration		Fair or better
				Bridge Vertical Clearance		Fair or better
Preserve and Maintain the State Transportation System	Preserve and modernize highway infrastructure	Maintain structural integrity of bridges	Bridge	Bridge Index	Fair or better	Fair or better
				Bridge Sufficiency Rating		Fair or better
				Bridge Rating		Fair or better
				Percent Deck Area on Functionally Obsolete Bridges		Fair or better
		Improve pavement ride quality for all corridor users Reduce long-term pavement maintenance costs	Pavement	Pavement Index	Fair or better	Fair or better
				Directional Pavement Serviceability		Fair or better
				Percent Pavement Area Failure		Fair or better
Enhance Safety and Security	Provide a safe, reliable, and efficient connection for the communities along the corridor Promote safety by implementing appropriate countermeasures	Reduce fatal and incapacitating injury crashes for all roadway users	Safety *(Emphasis Area)*	Safety Index	Above Average	Average or better
				Percent SHSP Emphasis Areas		Average or better
				Directional Safety Index		Average or better
				Crash Unit Type		Average or better

5.0 NEXT STEPS

The overall Corridor Profile Study process is shown in **Figure 6**. The process consists of eight tasks where the final results will provide candidate projects for P2P prioritization and inform the LRTP Update. The next step in the SR 87/SR 260/SR 377 Corridor Profile Study will be to conduct a needs assessment based on the relationship between the existing performance and the desired performance (Task 4). The corridor team will compare measured performance completed in Task 2 to the Corridor Objectives and Goals identified in this Working Paper 3 (Task 3). A "need" is identified when measured performance does not meet the expected performance objective.

The next deliverable, Working Paper 4, will report the findings from a needs analysis to help identify strategic improvements. The needs analysis will take a detailed look at the available data sets for each of the primary and secondary performance measures (including the "hot spots"). Following the needs assessment, "strategic solutions" will be developed to address the identified needs and improve performance (Task 5).

Figure 6: Profile Study Process



Task 1 assesses work already completed in the corridor through a literature review
Task 2 determines existing corridor performance based on data collected for the identified performance areas (pavement, bridge, mobility, safety and freight)
Task 3 develops long-term goals and objectives that define how the corridor can be expected to function, its primary purpose and performance emphasis areas
Task 4 assesses corridor needs by comparing existing conditions to expected performance
Task 5 formulates strategic candidate solutions to raise performance levels throughout the corridor with a focus on elevated need areas
Task 6 uses life-cycle cost analysis and benefit-cost analysis to determine the most cost-effective solution option
Task 7 determines performance effectiveness and risk factors for use in prioritizing solutions
Task 8 describes the recommended solutions using pre-scoping reports for future use in programming projects